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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
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PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,
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[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR ANALYZING HAIR AND/OR PREDICTING AN OUTCOME OF A HAIR-COLORING TREATMENT

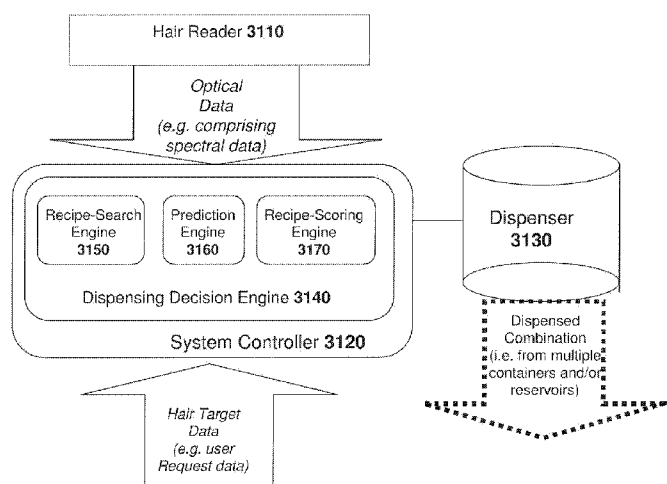


FIG. 1

(57) Abstract: The present disclosure relates to devices and methods for analyzing hair and/or predicting an outcome of hair-coloring treatment. disclosed is method of predicting a result of a hair-color-modifying treatment on a sample of hair, the method comprising: a. for each given region of a plurality of distinct regions, respectively measuring a region-specific spectrum of respective material of the hair-sample respectively disposed within the given region; and b. computing first and second predicted post-treatment spectra respectively from first and second initial spectra by respectively predicting a transformation of the first and second initial spectra following subjecting the sample of hair to the hair-color-modifying treatment, the first and second initial spectra being distinct and (i) derived from the plurality of measured region-specific spectra and/or (ii) corresponding to first and second of the measured region-specific spectra.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2015/000724

| A. CLASSIFICATION OF SUBJECT MATTER INV. G01J3/46 B01F13/10 G01J3/50 G01N21/31 G01J3/02 A61B5/00 G01N21/84 ADD. According to International Patent Classification (IPC) or to both national classification and IPC | | | | | | | | | | | | | | |
|---|--|---|---|--|-----------------------|--------|--|--|---|--|-------|---|--|------------------------------------|
| B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) G01J B01F G01N A45D A61B Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data | | | | | | | | | | | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; padding: 5px;">Category*</th> <th style="width: 70%; padding: 5px;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width: 20%; padding: 5px;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top; padding: 5px;">X Y</td> <td style="padding: 5px;"> US 6 807 297 B1 (TANKOVICH NIKOLAI [US] ET AL) 19 October 2004 (2004-10-19) figures 2, 4 ----- </td> <td style="vertical-align: top; padding: 5px;"> 1,18,54,57 1-16, 18-20, 23-28, 54-58 </td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;"> US 6 330 341 B1 (MACFARLANE DARBY SIMPSON [US] ET AL) 11 December 2001 (2001-12-11) column 3, line 24 - line 50; figures 4,5 ----- </td> <td style="vertical-align: top; padding: 5px;"> 18,57 </td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;"> US 2007/159290 A1 (GROSSINGER NADAV [IL] ET AL) 12 July 2007 (2007-07-12) figure 1 ----- -/-- </td> <td style="vertical-align: top; padding: 5px;"> 1-16, 18-20, 23-28, 54-58 </td> </tr> </tbody> </table> | | | Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | X Y | US 6 807 297 B1 (TANKOVICH NIKOLAI [US] ET AL) 19 October 2004 (2004-10-19) figures 2, 4 ----- | 1,18,54,57 1-16, 18-20, 23-28, 54-58 | A | US 6 330 341 B1 (MACFARLANE DARBY SIMPSON [US] ET AL) 11 December 2001 (2001-12-11) column 3, line 24 - line 50; figures 4,5 ----- | 18,57 | Y | US 2007/159290 A1 (GROSSINGER NADAV [IL] ET AL) 12 July 2007 (2007-07-12) figure 1 ----- -/-- | 1-16, 18-20, 23-28, 54-58 |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | | | | | | | | | | | |
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| A | US 6 330 341 B1 (MACFARLANE DARBY SIMPSON [US] ET AL) 11 December 2001 (2001-12-11) column 3, line 24 - line 50; figures 4,5 ----- | 18,57 | | | | | | | | | | | | |
| Y | US 2007/159290 A1 (GROSSINGER NADAV [IL] ET AL) 12 July 2007 (2007-07-12) figure 1 ----- -/-- | 1-16, 18-20, 23-28, 54-58 | | | | | | | | | | | | |
| <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. </div> <div> <input checked="" type="checkbox"/> See patent family annex. </div> </div> | | | | | | | | | | | | | | |
| <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> * Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table> | | | * Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family | | | | | | | | | | |
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| Date of the actual completion of the international search <div style="text-align: center; font-size: 1.2em;">17 August 2015</div> | | Date of mailing of the international search report <div style="text-align: center; font-size: 1.2em;">16/11/2015</div> | | | | | | | | | | | | |
| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 | | Authorized officer <div style="text-align: center; font-size: 1.2em;">Rödig, Christoph</div> | | | | | | | | | | | | |

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/000724

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|--|
| Y | <p>US 2005/036677 A1 (LADJEVARDI MAHMOUD [US]) 17 February 2005 (2005-02-17)</p> <p>paragraph [0046]; figure 1 -----</p> | <p>1-16, 18-20, 23-28, 54-58</p> |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2015/000724

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-16, 18-20, 23-28, 54-58

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16, 18-20, 23-28, 54-58

predicting the result of a hair treatment based on measured region-specific spectra/colorimetric data

2. claims: 29-33, 39, 59-62

spectral imaging method, in which light is spectrally dispersed in the image plane

3. claims: 17, 21, 22, 34-38, 40-44

imaging method transforming elongated regions having specific aspect ratios from the object plane to the image plane

4. claims: 45-53, 63

correlation between scalp and hair spectra

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2015/000724

| Patent document cited in search report | | Publication date | | Patent family member(s) | | Publication date |
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